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ABSTRACT

This study used data from the base year and first followup year of the National Educational Longitudinal Survey of 1988 (NELS:88) to investigate determinants of achievement in minority versus nonminority students. In the base year, the NELS:88 collected data on eighth graders. Because there were so few American Indians, that group was eliminated from the analysis. Since the results for Asian students were virtually identical to those for white students, the groups were combined. Analysis of data from six subgroups indicated that while gender and race/ethnicity differences existed, other significant differences emerged. Of the six groups, the schooling performances of African Americans, especially males, were least well explained. Three variables proved statistically significant in all six groups (student comfortable in high school scale, student attitude toward teachers index, and eighth grade mathematics test score), though the differences emerged in terms of magnitude and direction of effect. Results indicated that the linkage between achievement and expectations embodied in the status attainment model best applied to Asian American and white students. Mickelson's paradox of expectation/achievement held true for African American and Hispanic students. The paper recommends further exploration of factors not common to all groups. An appendix presents independent variables included in the regression analysis. (Contains 84 references.) (SM)

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Laboratory for Student Success

A Research Report

The Determinants of Achievement: Minority Students Compared to Nonminority Students

by

Judith C. Stull

La Salle University

2002
Publication Series No. 4

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Center for Research in Human Development and Education

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The Determinants of Achievement:
Minority Students Compared to Nonminority Students

Judith C. Stull

Why do certain minority students perform poorly in school? The issue is not a new one as, more than fifty years ago, Davis (1948) studied the academic failures of African American children in the 1930s then moving from rural to urban areas. Erickson (1987) argues that explanations for failure have progressed from genetic deficiencies, to cultural deficiencies, to social structural inequities. The onus of responsibility moves from the individual to the cultural group, and then to the society. In the process, the role of the student in learning diminishes, perhaps even disappears. According to McDermott (1987), the problem is inherent in how schools are structured as a whole, not in any particular component such as the academic or vocational curriculum. How else is success defined other than the absence of failure?

Explanations of Variations in Educational Achievement

Traditionally, the primary explanation for identifying the determinants of educational achievement has been the status attainment model developed largely by sociologists at the University of Wisconsin in the 1960s (Sewell & Hauser, 1980). The model was constructed and elaborated upon using data from predominantly white male subsamples (Alexander & Eckland, 1974; Alexander, Eckland, & Griffin, 1975; Duncan, Haller, & Portes, 1968; Haller & Portes, 1973; Sewell, Haller, & Strauss, 1957; Sewell & Shah, 1967, 1968a, 1968b). In fact, Sewell and Hauser (1980, p. 85) reported that the Wisconsin data included less than 2% minorities.

Until the mid-1970s, when other scholars sought to extend the Wisconsin model to females and minority, largely African American, populations, the researchers tacitly assumed that their findings, based predominantly on white males, could be generalized to all students at all grade levels. Some scholars reported that the Wisconsin model explained educational expectations and attainments for white males better than it did for females or minority males.

Using data sets that did not include the full range of race/gender types, researchers found the model both explained less variance and exhibited complex statistical interactions (Alexander & Eckland, 1974—females; Hout & Morgan, 1975—African Americans and females; Kerkhoff & Campbell, 1977—African American males; Porter, 1974—African Americans; Porter & Wilson, 1976—African Americans; Treiman & Terrell, 1975—African Americans and females). Even the major analyses of the *High School and Beyond* data (Alexander & Pallas, 1985; Coleman & Hoffer, 1987; Coleman, Hoffer, & Kilgore, 1982; Hoffer, Greeley, & Coleman, 1985; Jencks, 1985; Willms, 1985) shed little light on the effects of race and gender on educational achievement or expectations because these phenomena were treated as variables whose effects were to be eliminated through statistical control rather than as effects of interest in themselves.

Other researchers began to address the issues raised by the relative lack of success in applying the Wisconsin model to understand the different patterns of achievement of nonwhite and/or nonmale students. This literature, mostly ethnographic in approach, focuses explicitly on educational processes and on the complex interactions between these and family background/cultural processes (for example, see Grant, 1984; Matute-Bianchi & Ogbu, 1986; Ogbu, 1981, 1986, 1987; Peshkin, 1991; Schofield, 1989; Weis, 1990). Researchers then began to combine the insights from the ethnographic tradition with the methodological rigor of the status attainment tradition (Dornbusch, Steinberg, & Ritter, 1990; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Steinberg, 1986; Steinberg, Brown, Cider, Kaczmarek, & Cary, 1988; Steinberg, Dornbusch, & Brown, 1992a; Steinberg, Lamborn, Dornbusch, & Darling, 1992b), but again the populations were limited. The data sets used allowed the researchers to study student–peer and student–family processes in a small number of ethnically diverse contexts. Specific issues explored include the effects of differences between ethnic/racial groups:

- in what parents and other adults teach children about the importance of school,
- in conflicts between parent and peer pressures relating to school performances, and
- in the relationships of parenting practices to adolescents' educational achievement.

Throughout these discussions, the one constant is that as a general proposition, minority students continue to lag behind nonminority students in achievement, however it is measured. While the gap has closed some, the problem remains.

The explanations of the different patterns of achievement associated with student differences (e.g., gender, race/ethnicity, or community) have changed. Broadly speaking, genetic deficiencies were used until the 1960s, when explanations of cultural deficiencies within the student's microenvironment began to appear. In the 1970s, the discourse was broadened to include the larger social context (Bourdieu, 1974; Bowles & Levin, 1968; Giroux, 1983; Ogbu, 1974, 1979; Willis, 1977). Mickelson (1990) has argued that the achievement/attitude paradox of African American males, i.e., the lack of consonance between academic achievement and educational expectations, can be explained in terms of the long-lasting effects of forced migration and slavery (Ogbu, 1987). Other researchers found that the paradox extends beyond this particular group and applies to other types of students as well (Rigsby, Stull, & Morse-Kelly, 1997).

There is a substantial research base on student differences. According to Peng, Wright, and Hill, "research literature has revealed that multiple variables of home, school, and individual students are related to student learning" (1995, p. 5). In general, African American and Latino students do not perform on the same level as White or Asian American students. However, not all minority students fail (Finn & Rock, 1997). Some succeed and others succeed beyond what would be predicted given their economically disadvantaged backgrounds. Also, not all students who fail are minority students. Interestingly, according to Kantor and Brenzel, "though growing up in a poor family increases the likelihood that a student will experience academic difficulties, increases in the proportion of low-income students in a school are associated with decreases in achievement even after individual and family characteristics have been taken into account" (1992, p. 29). Using school level data only, Yancey and Saporito (1997) found that the social class composition of the school is a determining factor in understanding the differential patterns of

achievement in two large cities, Philadelphia and Houston. Battistich, Solomon, Kim, Watson, and Schaps (1995) found that a supportive community context could compensate for stressful family situations.

Several explanations have been posited to account for differences among race and gender categories in educational achievement. Differential levels of family poverty most directly apply to racial/ethnic groups. Studies have shown that higher levels of poverty among African Americans can account for some of the achievement differences relative to Whites. Parenting practices supportive of educational achievement have been shown to affect both racial/ethnic and gender differences. Yao (1985) found the highly structured family life of Asian American students accounted for their high achievement. Hunt and Hunt (1979) found little support for the traditional view that the single parent household lowers the achievement of African American males, finding that African American females, especially in segregated contexts, suffer more. Scheinfeld (1983) concluded that the quality of parent/child interaction is far more important in shaping the academic success of African American children than is the absence of the father alone. Steinberg and his associates have shown that the most effective parenting practices in supporting school performance vary by racial/ethnic differences (Dornbusch, Ritter, & Steinberg, 1991; Steinberg et al., 1992a).

Fordham (1985) argues that achievement differences are results of a clash in cultures. Basing his findings on an analysis of interviews with high school students, Fordham reports that the students felt that they were pulled in two different directions. On the one hand, there is the "Black fictive-kinship system" with its emphasis on the collective (Fordham & Ogbu, 1986). On the other hand, there is the individualistic, competitive ideology of American schools. She argues that one strategy African American students in her study used to promote upward mobility (i.e., higher academic achievement) was to become "raceless," that is, to ignore the limitations of the kinship network by dissociating from the peer group's pressure. DeVos (1973) found that a strong

kinship network helped the achievement of Japanese students, as the Japanese value system highly regards both affiliation and individual accomplishment.

Thus, these possible explanations, taken together, amount to an argument that the student's educational achievement is the result of personal and social experiences interacting with the skills and knowledge a person brings to the developmental context. There is continuity in educational achievement because there is continuity in the structures and processes that affect them. Therefore, if race and gender do structure educational experiences, these factors must be incorporated into the framework that explains educational achievement.

The Research Base: School Characteristics

Research on schooling effects has progressed along two divergent paths. Along one path, schools are assumed essentially homogeneous, and student and family diversity is emphasized (Coleman et al., 1966). Working within this tradition, Oakes (1989) found that teachers treated minority students differently than nonminority students. Farkas, Grobe, Sheehan, and Shuan (1990) argued that "teacher judgments of student noncognitive characteristics are powerful determinants of course grades" (p. 140). However, strategies successful with one minority group are not necessarily transferable to another, as Voigt, Jordan, and Thorp (1987) found when they tried to export a classroom management system that had been successful with Hawaiian students to an Arizona school with Native American students. Cultural difference is the root problem (Delgado-Gaitan, 1987; Giroux, 1983; Losey, 1993; Matute-Bianchi & Ogbu, 1986; Slaughter-Defoe, Nakagwa, Takamish, & Johnson, 1990). In studying immigrants from Central America, for example, Suarez-Orozco (1987) argued that different minority populations face different kinds of school problems. Others (Centra & Potter, 1980; Mullis et al., 1994) have argued that research on student characteristics and behavior should be augmented with teacher and school factors.

The other body of literature emphasizes school and program diversity while treating students as though they were homogenous (Raudenbush, Fotiu, Cheong, & Ziazi, 1996; Stedman,

1987; Walberg, 1986; Wang, Haertel, & Walberg, 1993). This research seeks to identify the characteristics of schools that effectively forge student achievement. In this context, schools with such characteristics as strong leadership, high expectations, an orderly environment, and frequent and systematic evaluations are regarded as successful. Arnold (1995) looked at factors that related positively to achievement, including fiscal and physical resources, student body composition, community characteristics, school social structure, climate, and instructional organization and methods.

In general, research shows that students react not only to changes in how schools are organized, but also to perceived or actual differences in treatment. Oakes (1985) found that teachers treated minority students differently than White students. Feldman and Saletsky (1986) found that the probability that students exhibited negative behaviors at school that lead to delinquency varied by racial group. They concluded that the minority students' perceptions of differential treatment by teachers contributed to subsequent involvement in delinquent behaviors. Jenkins (1995) found that, among middle school students, race was less of a factor than gender in understanding commitment to school and teacher expectations, which, in turn, was used to explain involvement with delinquent behaviors.

Student commitment can also be measured by involvement in programs or activities at school. According to McNeal (1995), school involvement among high school students occurs through participation in extracurricular activities, particularly athletics and fine arts. Students who participate in athletics and fine arts are less likely to drop out of high school. Students' participation in academic or vocational clubs did not have an effect on the dropout rate in McNeal's study. In the analysis, "dropout forces," such as male gender, African American or Hispanic race/ethnicity, and low family SES were distinguished from "pullout forces," such as gainful employment.

Despite the extent of research on this topic, there are two remaining issues. First, analyses must be done on data broad-based enough to extend the discussion to the national level.

Secondly, the interaction effects of race and gender must be brought into the discussion in a systematic yet encompassing manner. This paper looks at data in a six-group analysis, taking into account male/female and race/ethnicity differences.

Research Design

This paper uses data from the National Educational Longitudinal Survey of 1988 (NELS:88; National Center for Education Statistics, 1988). In the NELS:88 data set, a multilevel sampling frame was used to select students in 1988, when the eligible student population was in the 8th grade. Once the schools were selected, students within the schools were randomly selected. While the number of students remained constant over time (to compensate for mortality, new students with similar characteristics were added), the specific schools attended did not because most students changed schools by the 10th grade. In each wave of data collection, the selected students, some of their teachers, and school administrators or their designated agents filled out the relevant questionnaires. The students took tests in reading, history, science, and mathematics. These analyses seek to explain the mathematics test results. These test results were chosen over the others as a means of reducing the confounding effects of cultural bias. The mathematics test was chosen so as to lessen the effect of a non-English speaking, non-American background. The 40-question, timed test draws on a variety of mathematical skills and knowledge.

Data from the Base Year and First Follow-Up Year student files are used in this paper to identify the determinants of achievement. To account for sampling effects, all data were weighted according to National Center for Education Statistics (NCES) specifications. After the data were cleaned and reconciled, some variables were converted directly into interval format. In addition, additive and weighted scales were constructed in both the Base Year (25 scales) and First Follow-Up Year (63 scales). This was done for three reasons:

1. high-order statistical analyses such as multiple regression require interval level measures;

2. analyses using composite rather than single item variables have more desirable statistical properties; and
3. the system files could be reduced enough so that the panel analysis could proceed.

Two race/ethnicity-based modifications in the data were made. First, because of the group's relatively small size, American Indians were eliminated from the analysis. Second, since the results for the Asian students were virtually the same as those for the White students, the groups were combined, thereby reducing data complexities. Also, because of questionnaire differences dropouts were eliminated. "Freshened students," those students who were added in the First Follow-Up Year, were eliminated. Thus only students in both the Base Year and the First Follow-Up Year were included.

Data were analyzed using Two Stage Least Squares (TSLS) multiple regression analysis. The student's expected number of years of educational attainment was the dependent variable in the first stage. The predicted values from this stage were then used along with other exogenous variables to explain the differences in achievement on the 10^{th}-grade mathematics test. Separate regressions were run on the six subgroups. TSLS multiple regression analysis is the appropriate estimation procedure in situations where there is a simultaneous interaction between the dependent variable and one or more of the independent variables in a regression model. The need for this procedure in the current study arises because of the two-way relationship between mathematics achievement score (the dependent variable in the model) and educational expectations (one of the independent variables). It is reasonable to assume that educational expectations are important determinants of mathematics achievement. Students who have high educational expectations will put more effort into their schoolwork and will then exhibit higher achievement. It is equally reasonable, however, to assume that the relationship runs in the opposite direction—namely, that mathematics achievement has a strong influence on educational expectations. It is highly likely that, for example, students who achieve academic success in mathematics have higher educational expectations than those who do not succeed in mathematics.

The existence of such simultaneity means that ordinary least squares (OLS) estimators are neither unbiased nor consistent estimators of the model's parameters.

Simultaneity and interaction are two concepts that are easily confused. The term "interaction" embodies a variety of relationships between two or more variables. Simultaneity is but one form of interaction in which a two-way causal relationship exists.

Variables

Throughout the analyses, the dependent variable is the score on the standardized test of mathematics achievement given in 1990. Three different forms of this test were given in the First Follow-Up Year, with a more difficult form given to those scoring in the highest quartile on the Base Year test and a less difficult form given to those scoring in the lowest quartile. Those students who scored in the middle two quartiles received the "regular" form. The NCES-provided Item Response Theory (IRT) scores were used to ensure that comparisons among all students were equivalent. These scores, the 10^{th}-grade math test results, are the dependent variable in the first regression analysis. Educational expectations, translated from an ordinal ranking scheme to the number of years of education expected associated with that category (e.g., high school graduate = 12 years; college graduate = 16 years, etc.) were measured in the sophomore year. These values constitute the dependent variable in the second regression analysis (Table 2). The questions on which measures were based are described in more detail in the appendix.

Two family influence measures were included in the analyses: family socioeconomic status (SES) and parental school involvement. NCES created a measure of family SES from student questionnaire data on parents' education, occupations, income, and possessions. A positive relationship between SES and educational achievement, probably the most consistent finding in the literature of sociology of education, is expected. Parental involvement is measured by a weighted scale constructed from questionnaire data on how parents were involved in the school. Attending a school event (e.g., a baseball game) was given the least weight, and

volunteering in school was given the most weight. A positive relationship between parental involvement and both educational achievement and expectations is anticipated. "Mother expects R to go to college" is a dummy variable constructed from a question that asked students how much education they thought that their mothers expected them to complete. The number of years of education that either parent expected their child to complete did not prove significant, but this variable did. "Father's expectations" did not prove to be a factor, which Smith (1989) also found. A positive relationship between achievement and "Mother's" expectations is anticipated.

The effects of the peer group were captured in the "Nonacademic peer pressure" index, a computed scale that measures nonacademic priorities and pressures of the peer group (importance of sports, having a steady date, being willing to party, etc.). Since Coleman's (1961) *The Adolescent Society* was published, researchers have studied the effects that peer groups have on the educational commitment and performance of adolescents. A number of studies have reported contextual effects of peers, for example, relationships between percentage of peers who are middle class (Coleman et al., 1966; Sewell & Armer, 1966) and achievement, but fewer studies have documented direct interpersonal influences of peers (Epstein & Karweit, 1983). Nevertheless, there is substantial intuitive appeal to the notion that peers under different circumstances exert positive and/or negative pressure on achievement and expectations (Rigsby & McDill, 1972).

Eight student-level variables were included. The "Student is comfortable in high school scale" and the "Student attitude toward teachers index" were included as measures of school engagement. In both cases, the higher the score, the more positive the student was, indicating greater school involvement and interest. The "Locus of control" scale is an NCES measure constructed from items in the student questionnaire to measure the extent to which students feels in control of their lives. A positive relationship is expected.

Specific behaviors and habits relating to schoolwork are also important determinants of achievement. "Number of hours of homework per week student reports" is the average number of hours per week spent on homework as reported by students. A positive relationship is expected.

"In vocational program" and "In academic program" are dummy variables for, respectively, being enrolled in vocational and academic programs in high school. Membership in the general high school program, the largest category, was excluded, and comparisons are made to that group. Participation in the vocational or academic programs is expected to enhance performance relative to participation in the general program, as it is a nonspecific residual category.

The variable, "Student took algebra in 8th grade," a dummy variable based on questions in the 8th-grade student questionnaire about whether the student took algebra, an advanced math course, is expected to be positively related to mathematics achievement.

Different Resources: Means

Table 1 gives means and standard deviations for the variables, showing that differences in resources and access to experience for the analysis groups are apparent. There appear to be more differences along the race/ethnicity lines than gender. On some variables, all of the groups are alike: "Locus of control" and "Student attitude toward teachers." In other respects, the groups are dissimilar. Latino and African American students are disadvantaged relative to Asian American and White students in personal, family, and school resources. That is, Asian American and White students report higher family SES, greater school engagement, and more hours devoted to homework. Additionally, Asian American and White students are more likely than Latino and African American students to be enrolled in selective, upward mobility-oriented curricular options, such as academic high school programs and advanced 8th-grade math curricula. African American students are most likely to participate in vocational curricula. Finally, the sophomore standardized test score averages are higher for Asian American and White students.

Using the same data to make gender comparisons, we can see that, although the differences are small, girls are advantaged relative to boys when within-group comparisons are made on a number of variables: school engagement/belonging, reported hours spent doing homework, attitude toward teachers, and participating in the academic program. Finally, the girls generally have higher average educational aspirations than the boys.

Latino and African American students are often in an unusually disadvantaged position relative to other groups on many of the variables, males even more so than females. The 10th-grade test scores are notably lower, as is the probability of having taken advanced math in 8th grade and participation in an academic program. They report fewer hours of homework. Indeed, African American students report spending 40% fewer hours on homework than Asian American students. A possible explanation may be the differences in social class as measured by SES.

To summarize, these groups exhibit important differences in family supports, personal values and behaviors, schooling experienees, and schooling outcomes. Some of these differences are patterned systematically by race and gender. Other differences represent more complex interactions. Conditions of risk, access to schooling experiences, family supports, and so forth are different for these analytic groups, but are the determinants of "educational aspirations" and "achievement" also different? Whether these different circumstances capture somewhat different schooling processes for students is addressed in the regression analyses presented in Table 2.

Table 1
Means/Proportions and Standard Deviations of Included Variables

	Boys						Girls					
	Latino		African American		White		Latina		African American		White	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Parental involvement index	3.95	3.72	4.42	3.87	5.08	3.63	3.83	3.44	4.58	3.65	5.02	3.51
Family SES	-0.46	0.77	-0.38	0.79	0.19	0.74	-0.54	0.75	-0.41	0.77	0.15	0.75
Nonacademic peer pressure	12.33	2.60	12.17	2.66	12.14	2.49	12.17	2.41	12.16	2.31	12.27	2.28
Student is comfortable in high school scale	3.82	2.11	3.84	2.08	4.25	1.76	4.12	1.75	4.11	1.75	4.44	1.58
Student locus of control index	-0.01	0.64	-0.01	0.62	0.03	0.62	-0.03	0.63	0.00	0.66	0.07	0.60
Number of hours of homework per week students reports	6.53	6.01	5.41	5.05	7.55	6.46	7.03	5.67	6.26	5.48	8.71	6.67
Student attitude toward teachers index	4.52	1.59	4.34	1.60	4.40	1.67	4.63	1.56	4.51	1.50	4.51	1.63
Student is in the academic HS program*	0.27		0.26		0.36		0.27		0.31		0.39	
Student is in the vocational program*	0.14		0.20		0.11		0.12		0.16		0.07	
Student took algebra in eighth grade*	0.19		0.19		0.28		0.21		0.22		0.28	
Eighth grade mathematics test score	46.79	9.07	44.52	8.70	52.89	9.88	46.68	8.64	45.56	9.10	53.87	9.33
Tenth grade mathematics test score	36.58	20.04	34.02	20.64	41.41	16.96	34.88	18.98	33.24	19.26	41.03	16.21
Student expected years education	15.10	2.41	15.26	2.26	15.46	2.33	15.43	2.60	15.90	2.67	15.86	2.35

* Dummy variable

Different Educational Processes

The model underlying the analyses presented in Table 2 builds on the status attainment tradition. It posits that adolescents want to do as well as they can in school, that they want to get as much education as they can to maximize their potential earning power and occupational success, and that their families will support such efforts to the extent that they can. It assumes that personal academic values and commitments, parental and peer support for school, positive school experiences, extent of effort expended, and the existing store of school skills, knowledge, and ability account for successful performances.

Mathematics Achievement

In Table 2, the dependent variable is academic achievement measured by 10th-grade mathematics test results. In looking at the *R* Squares, we see the model applies more directly to White students than to the other racial/ethnic groups.

If we ignore statistical significance, some common elements of an explanation of mathematics achievement emerge from the sign and rough magnitude of the coefficients. The students' sense of belonging in high school is negatively related to test scores and is always statistically significant. Here, a negative relationship means that those students who are comfortable in high school do less well than those students who are not comfortable. Since academic issues were not a part of this scale, a probable conclusion is that for some students, school is a place for social as opposed to educational encounters.

Parental involvement with school is generally positive and benefits African Americans and Latino boys the most. Increases in family SES always add to the mathematics test score, but the size of the effect varies. A 1-unit increase in SES adds the most for African American males (2.6772). The number of hours of homework is positively related to test scores, but given the small sizes of the coefficients, more study is warranted. The coefficient is the largest for Latino

students for whom, all other things equal, expending considerable effort, for example, 10 hours of homework per week, results in an increase of 19 points on the math test.

All other things equal, enrollment in a vocational high school program lowers achievement, as compared to students' performance in a general program, for all groups except Latino boys and African American girls. As expected, participation in an academic track adds to test scores, but in different strengths as evidenced by the differences in magnitude of the regression coefficient. The same is true of the advanced math in 8th-grade dummy variable. Adding the coefficients for participation in the academic high school program and for having taken advanced math in 8th grade, the differences between the groups becomes even more apparent. All other things equal, a "yes" response on both of these variables adds 5.4 points to the test score for Latina students, but only .8 to the African American male test score. It must be remembered that such factors as social class (SES) and prior ability (8th-grade test scores) have been held constant and cannot be used as explanations.

The expected relationship between educational expectations and achievement was found to hold only for White students, the coefficients produced in the first stage were both positive and significant in the second stage results. For the other groups, the relationship was either statistically insignificant, negative, or both. At the outset of the research, simultaneous relationship between these two variables was posited. All other things constant, it was expected that having high educational aspirations would prompt students to take school more seriously resulting in higher test scores. These results suggest that for minority students, high educational aspirations do not translate into higher achievement.

Table 2

Two-Stage Least Square Regression Coefficients for the Effects of Family, Peer, and Student Behaviors and Attitudes on Sophomore Mathematics Test

	Boys			Girls		
	Latino	African American	White	Latino	African American	White
Parental involvement index	.4840*	.5869*	.2621*	0.1886	.4957*	0.2403*
Family SES	2.0147*	2.6772*	0.441	0.2529	1.1249	0.9594
Nonacademic peer pressure	-0.3137	-0.8147*	.1824*	-.6227*	0.3507	0.1113
Student is comfortable in high school scale	-2.4452*	-2.3549*	-2.0661*	-2.049*	-2.1557*	-2.6008*
Student locus of control index	.4069*	2.7362	.9317*	1.9107	2.1045	.6102*
Number of hours of homework per week student reports	1.9414*	0.051	.1786*	0.1798	.2448*	.1287*
Student attitude toward teachers index	3.3739*	1.5018*	1.4488*	.9723*	2.1713*	1.4031*
Student is in the academic HS program*	0.1317	0.3678	1.5561*	1.4573	0.8152	1.1895
Student is in the vocational program*	5.8147*	-2.2068	-0.9995	-0.3752	2.7834	-1.1963
Student took Algebra in eighth grade*	.6781*	2.4069	2.2733*	3.9107*	.7492*	1.9434*
Eighth grade mathematics test score	.6781*	.6917*	.6929*	.5866*	.7492*	.7255*
Student expected years education	-1.209	-1.8161	.5843*	0.5873	-1.8161*	.6799*
R Square	0.2407	0.1618	0.3577	0.1646	0.2585	0.3634

* significant at the .03 level or better

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Summary

The research yielded two significant findings. First, the six-group analysis proved fruitful. While there were some male/female and race/ethnicity differences, other significant differences identified in the regression analyses emerged. Of the six groups, the schooling performances of African Americans, especially males, are least well explained. This finding is consistent with earlier literature (Hout & Morgan, 1975; Mickelson, 1990). While three variables proved statistically significant in all six groups (student comfortable in high school scale, student attitude toward teachers index, and eighth grade mathematics test score), the differences emerged in terms of magnitude and direction of effect. The factors not common to all groups should be explicated and explored further. The linkage between achievement and expectations embodied in the status attainment model best applied to Asian American and White students. Mickelson's paradox of expectation/achievement holds not only for African Americans, but Latino students as well.

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Appendix

Independent Variables Included in the TSLS Regression Analysis

10th-grade mathematics test score: The mathematics test was chosen to lessen the effect of a non-English speaking, non-American background. The 40-question, timed test draws on a variety of mathematical skills and knowledge. Three different forms of this test were given in the first follow-up year, with a more difficult form given to those scoring in the highest quartile on the base year test and a less difficult form given to those scoring in the lowest quartile. Those students who scored in the middle two quartiles received the "regular" form. The NCES-provided Item Response Theory (IRT) scores were used to ensure that comparisons among all students were equivalent. Range: 11.080–57.950.

Educational expectations: Translated from an ordinal ranking scheme to the number of years of educational experience associated with that category (e.g., high school graduate = 12 years; college graduate = 16 years, etc.). Range: 11–20.

Family Influence Measures

In addition to SES, parental support has generally been shown to be important to the well-being of adolescents, with the "right" kinds of support promoting educational achievement. What type of involvement is right may vary from group to group or depend on the maturity and self-monitoring capacity of the adolescent. For some, the most consistent payoff is from general monitoring (some rules and high-performance expectations) but not direct intervention in homework or tight behavioral control. The latter are judged inconsistent with the development of adolescent responsibility and self-monitoring (Steinberg et al., 1988). However, Taylor (1994) and Brown, Mounts, Lamborn, and Steinberg (1993) have argued that appropriate parenting practices also vary with the social context in which the family lives. Neighborhoods with high levels of drug use or violence among teens may elicit much more monitoring and parental control.

In less threatening environments, tight control and detailed intervention seem to indicate that school performance and behavior are already problematic. To some extent, the schooling and social behaviors of students mandate support and control from parents. Optimally, parents support but do not control when children are developing within the typical bounds of acceptable behavior. They often intervene afterward, if social behavior or educational achievement falls outside the typical bounds of acceptability.

SES: NCES created a measure of family SES from student questionnaire data on parents' education, occupations, family income, and possessions. Perhaps the most consistent finding in the literature of sociology of education is a positive relationship between SES and educational achievement. Range: -2.790–2.954.

Parental involvement: Parental involvement is measured by a weighted scale constructed from questionnaire data on how parents were involved in the school. Attending a school event (e.g., a baseball game) was given the least weight, and volunteering in school was given the most weight. Range: 0–10; Alpha: .69.

Mother expects college: A dummy variable constructed from a question that asked how much education students thought that their mothers expected them to complete. The number of years of education either parent expected did not prove significant, but this variable, which emphasizes the presence or absence of maternal desire for college, did. Father's expectations did not prove to be a factor, which Smith (1989) also found. Mother expects college (0 = no, 1 = yes); 87.2% yes.

Outside Pressure Measures

Since Coleman's 1961 work, *The Adolescent Society*, was published, researchers have studied the effects that peer groups have on the schooling commitments and performances of adolescents. A number of studies have reported contextual effects of peers—e.g., relationships between middle-class peers (Coleman et al., 1966; Sewell & Armer, 1966), but fewer studies have documented the kinds of direct interpersonal influences from peers that concern many parents (Epstein & Karweit,

1983). Nevertheless, there is substantial intuitive appeal to the notion that peers affect and reinforce both positive and negative schooling behaviors (Rigsby & McDill, 1972). This study explored a number of different measures of peer influences and found only one that had any systematic effect on educational achievement.

Nonacademic peer pressure: A computed scale that measures nonacademic priorities and pressures of the peer group (importance of sports, having a steady date, being willing to party, etc.). This variable measures peer support for nonacademic activities. The logic of Coleman et al. (1966) would suggest a negative effect. Range: 0–15 (strong negative support); Alpha: .55.

Students' Values Relating to Future Success and School Commitment

A long tradition in the sociology of education has argued that adolescent personal values and ambition play an essential role in developing the commitment and personal discipline to achieve success in school.

Student is comfortable in high school index: A scale that measures the student's feeling of belonging in high school. This was used as a measure of school engagement, structuring the scale so that a higher score indicates greater school involvement and interest. Range: 0–6; Alpha: .76.

Locus of control: A scale constructed by NCES from items in the student survey to measure the extent to which students feel in control of their lives. Range: -2.79–1.460.

Students' School-Related Behaviors

Specific behaviors and habits relating to schoolwork are also important determinants of school performance.

Number of hours of homework per week student reports: The average number of reported hours per week spent on homework. Range: 0–34.

School-Related Opportunities and Attitudes

"In vocational HS program" and "In academic HS program" are dummy variables for, respectively, enrollment in the vocational program and enrollment in the academic program in high school. Membership in the general high school program, the largest category at 53.6% of all students surveyed, was excluded. Comparisons are made to that group.

In academic HS program: 36.2%.

In vocational HS program: 10.2%.

Student attitude toward teachers index: A measure of students' assessments of the quality and caring of teachers in the school. Range: 0–6; Alpha: .70.

Student took algebra in 8th grade: A dummy variable based on the proportion of students in an advanced math course in 8th grade. This is an indicator of whether or not students are on the "fast track" for mathematics: 7th-grade pre-algebra, 8th-grade algebra, 9th-grade geometry, and 10th-grade algebra II). Students in advanced math in 8th grade: 27.11%.

The Laboratory for Student Success

The Laboratory for Student Success (LSS) is one of 10 Regional Educational Laboratories funded by the U.S. Department of Education to revitalize and reform educational practices in the service of student success.

The LSS mission is to significantly improve the capacity of the mid-Atlantic region--including Delaware, Maryland, New Jersey, Pennsylvania, and Washington DC--to enact and sustain lasting systemic educational reform by building on the resources and expertise of schools, families, and communities in the region to improve student learning. Through its broad-based programs of applied research and development and services to the field, LSS provides ongoing professional development and technical assistance to support efforts of local schools and state education agencies to achieve student success.

The U.S. Department of Education designated LSS as the lead laboratory in the specialty area of educational leadership. Accordingly, LSS will address issues of procedural knowledge on what effective school leaders need to know to create an environment that supports high-performing learning communities. In addition, LSS will advance the knowledge base through case studies and a program of intensive technical assistance and professional development support to states and schools.

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